A Preliminary Investigation of the Pharmacological Potential of Winged Termites in the Management of Diabetes and Inflammation

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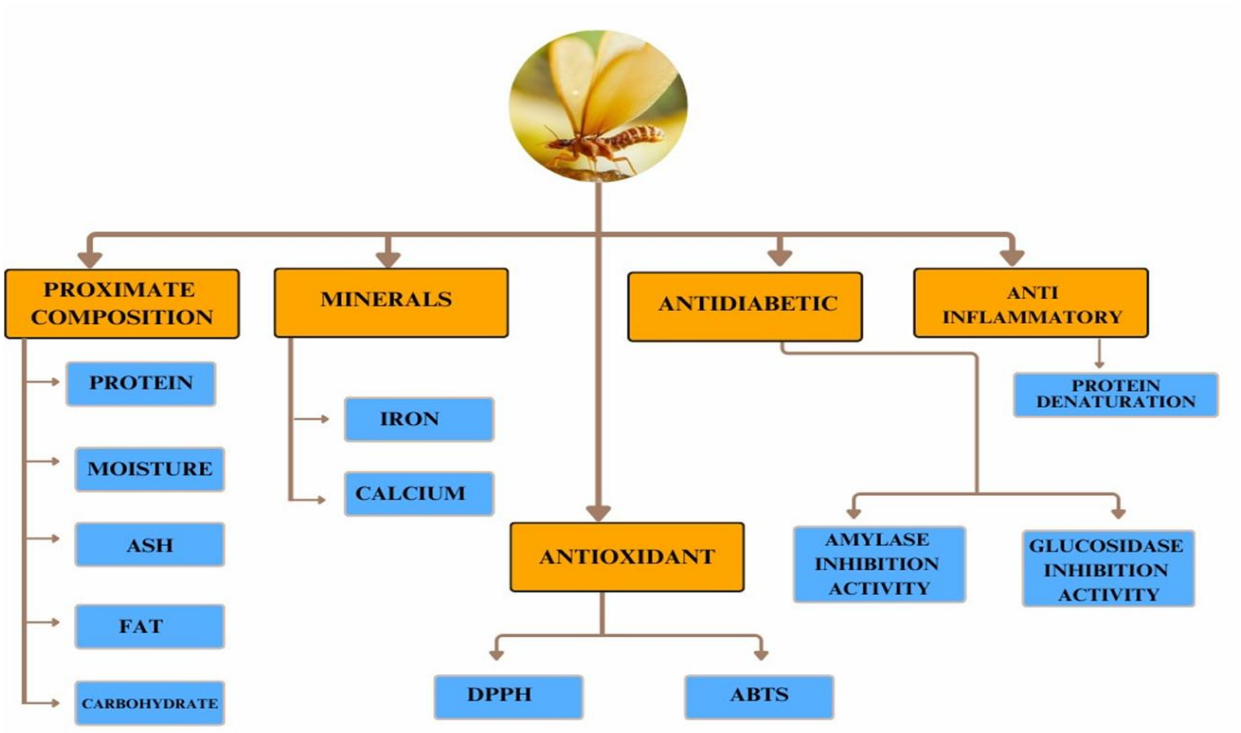
I. INTRODUCTION

- Insects possess numerous pharmacological benefits, making them a valuable resource for medicinal research. Relatively little study has been done in medical entomology, despite the fact that insects have been utilised in medicinal therapy extensively throughout history for almost on every continent
- Among them, winged termites have gained attention due to their traditional consumption by various communities. Many people consume these insects as food, recognizing their nutritional value and potential health benefits.
- An analysis was conducted on the nutritional composition of winged termites, focusing on their iron, calcium, carbohydrate, and protein content.
- Additionally, their antioxidant, anti-obesity, and anti-inflammatory activities were evaluated to explore their possible pharmacological applications

II. AIM AND OBJECTIVE



III. MATERIALS AND METHODS

SAMPLE COLLECTION AND PREPARATION

Dried winged termites were procured from the local area near Periyapalayam, Tamil Nadu, Chennai. Then the samples were powdered and 1% sample homogenate was prepared by using 1% PBS. Simultaneously known weight of sample was oven dried to prepare ash; and ash utilized for determination of moisture content, mineral analysis and ash content determination.

WINGED TERMITE

POWEDERED FORM OF WINGED TERMITE

ANALYSIS OF PROXIMATE COMPOSITION

- Proximate composition includes moisture content, Ash, crude protein and carbohydrate content; which were measured according to the AOAC.

DETERMINATION OF MINERALS

Calcium Iron

ASSAY OF ANTIOXIDANT ACTIVITY

ABTS radical scavenging assay

DPPH radical-scavenging activity (Dudonne *et al*.,2009)

ANTIDIABETIC ACTIVITY

In vitro α amylase inhibition activity (Telagari and Hullatti, 2015)

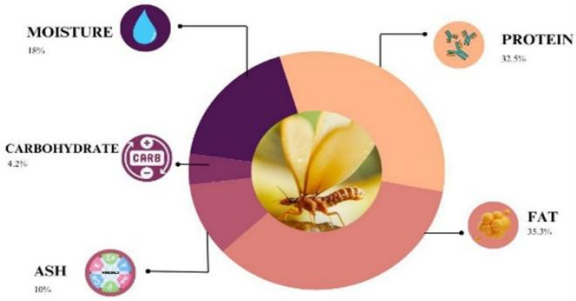
In vitro α glucosidase inhibition activity (Telagari and Hullatti, 2015)

EVALUATION OF ANTI-INFLAMMATORY PROPERTY

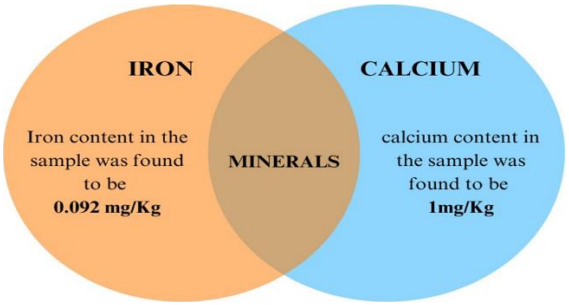
Protein Denaturation (Luis *et al.,* 2019).

RESULTS

PROXIMATE COMPOSITION OF WINGED TERMITES



TOTAL MINERALS CONTENT IN WINGED TERMITES



ANTI-OXIDANT ACTIVITY

A.2,2-DIPHENYL-1-PICRYLHYDRAZYL (DPPH) INHIBITION ASSAY

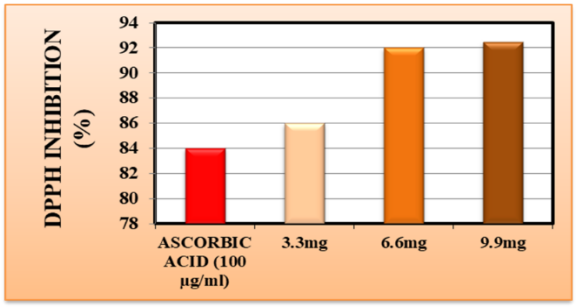


Figure A reveals the gradual increase in DPPH radical inhibition activity on increasing the concentration.

B 2,2′-AZINO-BIS-3-ETHYLBENZTHIAZOLINE-6-SULPHONATE

INHIBITION ASSAY

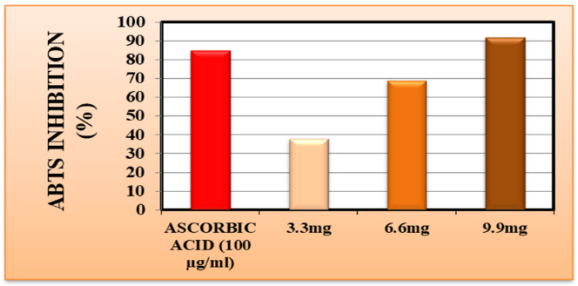


Figure A reveals the gradual increase in ABTS radical inhibition activity on increasing the concentration.

ASSESSMENT OF ANTIDIABETIC ACTIVITY

A.IN VITRO α -AMYLASE INHIBITION ACTIVITY

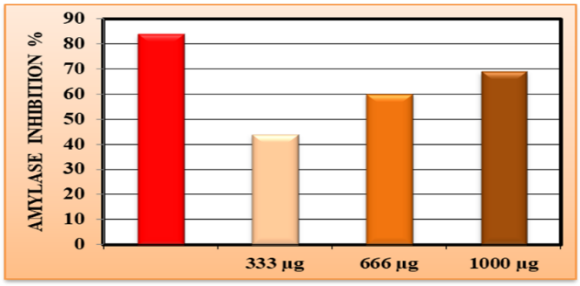


Figure A depicts the increase in α amylase inhibition activity on increasing the concentration.

A. IN VITRO α-GLUCOSIDASE INHIBITION ACTIVITY

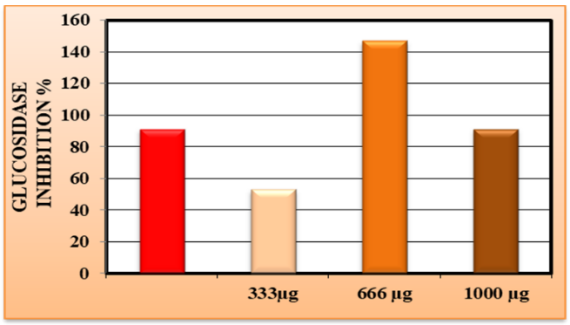


Figure D depicts the increase in α glucosidase inhibition on increasing the concentration from 333µg to 666µg, while on increasing the concentration to 1000µg, decline in α glucosidase inhibition was observed.

B. ANTI-INFLAMMATORY PROPERTY

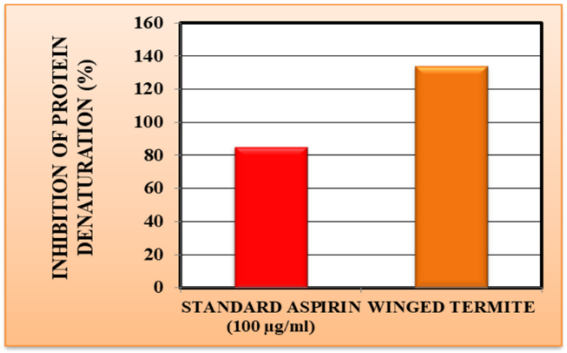
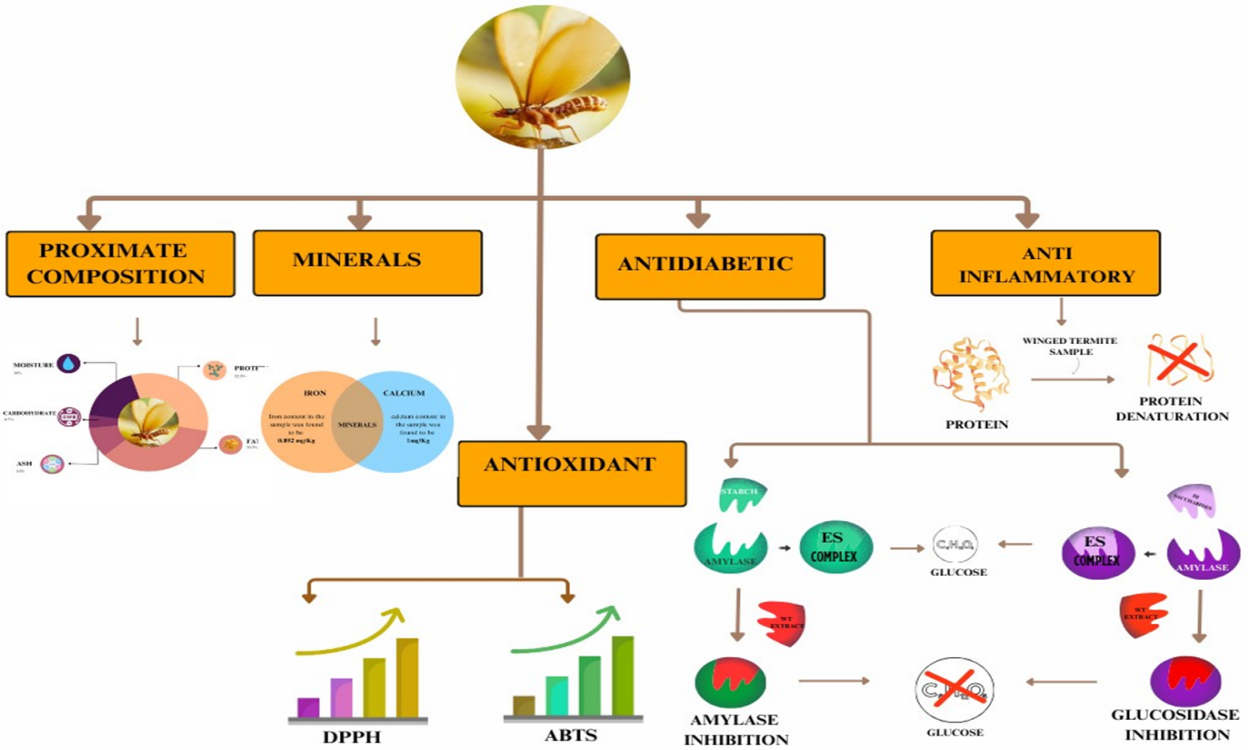


Figure 3 depicts the anti-inflammatory property of winged termites, which reveals that in terms of protein denaturation inhibition, anti-inflammatory property was tested and found a significant anti-inflammatory property as that standard.

IV. DISCUSSION



V. CONCLUSION

Unlike medicinal plants that are prominent in pharmaceutical research, the use of animals in traditional medicine and more specifically invertebrate animals such as insects has long been neglected.

Our finding on WT imparts a significant

- nutritional profile
- Anti-oxidant activity
- Antidiabetic activity
- Anti inflammatory activity

Future studies should focus on

- Isolating and characterizing the specific bioactive compounds responsible for these effects and understanding their mechanisms of action
- Explore ways to enhance consumer acceptance, such as developing insect-based supplements or processed formulations that make consumption more appealing.

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